

RECORD

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3.00

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18 Sept. 1967 Material in Kott:

No mark = Portal-Rodeo Rd.

Right Elytra clipped = 47971

19 Sept 1967 Parasite of trash-carrying lep. larva.

[T.E.] ~ 11:15 AM. ~~the~~ parasite emerged from larval lep. and commenced spinning ~ 1/2 hour afterwards.
"May have come out due to disturbance of larva."

[R.S.] ~ 1 PM - still spinning pupal case.
Case almost opaque, but ~~the~~ larva can be seen in silhouette, spinning.

~~All parasitized~~

20 sept Three more acquired. All are from Solidago, henceforth to be known as Exp. No. 465-B

GLANDS

♂

♀

The fewb. I call:

- ELEODES LONGICOLLIS
- MARGINED THORAX + ^{RUFOSE} ELYTRA
- ELEODES, BROWN BODIED
- GREY-TOPPED
- * ELEODES, ROBUST
- ELEODES, SHARP SPINED
- FAT-REARED MIMIC

+

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31

33

32

GLANDS

♂

♀

LONG, 2 ch. ? narrowed

+

SHORT

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+

-

~~BRASSICE~~ SHAPED

+

MITTEN-SHAPED

+

-

Members of the black-aposematism-
at-dusk complex:

- 1967 Eleodes longicollis
 1967 E. ROBUST
 1967 E. BROWN-BODIED
 1967 E. SHARP-SPINED
 1967 E. BLUNT-SPINED
 1966 Monolema
 1967 MELOID, RED + BLACK
 1968 MELOID, BLACK
 1967 Gonaspida
 1966 Megasida
 1967 HEMISPHERICAL TENEB.
 1966 GIANT BLACK WEEVIL
 1967 COMMON NON-SPRAYER
 1967 Psoimachus
 1967 Calozoma
 1967 Black locust w/ red wings
 1967 nymphal + adult Taeniopoda
 1967 Rugose-elytra, margined teneb.
 1967 Zopherus
 1967 Grey-topped teneb, RUNNER
 1966 Grey-topped teneb, FREEZER

21 Sept '67 Army ants (*Neivamyrmex*) versus
Fluffpuffs

18:50

2 fluffpuffs, naked and with fluff,
~~enter~~ placed in nest. Naked one
overrun and stung; immobile
within 5 minutes.

20:00

Full fluffed fluffpuff still alive and
moving.

20:05

Same experiment as above repeated.
The ants are now looking for ways
out, and are trying to climb the
container walls, which they cannot.
They also climb anything high and
so climb rather than attack the
fluffpuffs. But every once in a
while an ant does bite. More
ants climb atop the fluffpuffs
and tip it over.

20:23

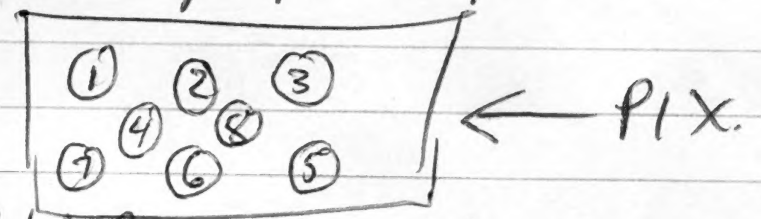
The naked one is on its back,
stung and immobile. Both
the fluffpuff in this expt and
the one before are still alive
& moving.

48

35

20 Sept 67 Chauliognathus propandus mimicry-complex
on plant number

- | | | | |
|-----------|------------|-----------|---------|
| ① | ② | ③ | ④ |
| dark | Sphered | Matillid? | Spider? |
| ⑤ | ⑥ | ⑦ | ⑧ |
| Matillid? | Chauliogn. | Spider? | Spider? |



- | | | | |
|---|---|---------------------------|---------------------|
| 1 | { | Portal-Rodero Rd 19 Sept | } mating
behav.? |
| 2 | | | |
| 3 | | | |
| 4 | { | Road to Paradise 20 Sept | |
| 5 | | | |
| 6 | { | Portal Rodero Rd. 19 Sept | |
| 7 | | | |
| 8 | | Road to Paradise 20 Sept | |

Photos with UV lens, distances.

- | | |
|-----|-------|
| (1) | 1 cm. |
| (2) | 2 cm |
| (3) | 3 cm |
| (4) | 4 cm |
| (5) | 5 cm |

~~198~~

36

Exp. #465

Plants with trash carrying
(ie, petal bearing) lep. larvae

#465-A

Portal-Rodeo Rd

#465-B

Solidago sp

Portal-Rodeo Rd

#465-C

Portal-Rodeo

3 PLANT IDENTIFICATION

+ Cont'd



37

37

PLANT IDENTIFICATION

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PLANTS IDENTIFIED FOR T. EISNER BY WM. J. DRESS,
P. A. HYYPIO, AND D. M. BATES. JANUARY, 1968

Plants are listed by experiment number. Where several numbers refer to the same specimen or species, the plant is identified under the first experiment number that refers to it. When the species appears later, the experiment number under which the name can be found is underlined, and is followed by all other experiment numbers that refer to the same plant.

Unless otherwise stated, all species are members of the family Compositae.

EXPERIMENT NUMBER(S)	NAME	DET. BY
462	<u>Gutierrezia Sarothrae</u> (Pursh) Britt & Rusby	WJD
463 =464, 465B, 493R2	<u>Hymenothrix Wislizenii</u> Gray	WJD
464 This experiment number refers to two separate plants:		
(1) =465G, 478	<u>Gutierrezia Sarothrae</u> (Pursh) Britt & Rusby	WJD
(2) =463, 465B, 493R2		
465 This is the series of desert composites: (V is not a composite)		
A	<u>Baileya pleniradiata</u> Harr. & Gray	WJD
B =463, 464, 493R2		
C =467B	<u>Verbesina encelioides</u> (Cav.) Benth. & Hook.	WJD
D =466, 467A, 477	<u>Viguiera dentata</u> (Cav.) Spreng.	WJD
E	<u>Heterotheca subaxillaris</u> (Lam.) Britt & Rusby	WJD
F =473	<u>Helianthus petiolaris</u> Nutt.	WJD
G =464(1)		
H	<u>Haplopappus gracilis</u> (Nutt.) Gray	WJD
I	<u>Parthenium incanum</u> HBK	WJD
J	<u>Bahia absinthifolia</u> Benth.	WJD
K	<u>Zinnia grandiflora</u> Nutt.	WJD
L	<u>Psilostrophe sparsiflora</u> (Gray) A. Nels.	WJD
M	<u>Zinnia acerosa</u> (DC.) A. Gray (<u>Z. pumila</u> Gray)	WJD
N	<u>Sanvitalia Abertii</u> Gray	WJD
(O This number not used)		
P	<u>Dyssodia pentachaeta</u> (DC.) Robins.	WJD
Q =475F	<u>Senecio longilobus</u> Benth.	WJD
R	<u>Gaillardia pinnatifida</u> Torr.	WJD
S	<u>Thelesperma longipes</u> Gray	WJD
T	<u>Dyssodia acerosa</u> DC.	WJD
U	<u>Dyssodia Hartwegii</u> (Gray) Robinson	WJD
V	<u>Erysimum capitatum</u> (Dougl.) Greene (CRUCIFERAE) PA	
W	<u>Haplopappus laricifolius</u> Gray	WJD
X	<u>Berlandiera lyrata</u> Benth. var. <u>lyrata</u>	WJD
Y SPECIMEN HAS NOT BEEN LOCATED		
Z	<u>Pectis filipes</u> Harr. & Gray	WJD

37

37

+ Cont'd
↓

FE

PLANTS IDENTIFIED BY W.M. J. DRESS, P.A. HYYPPIO,
& D. M. BATES
CONTINUED

EXPERIMENT NUMBER(S)	NAME	DET.
"Citronella weed" (No expt. no.)	<u>Pectis angustifolia</u> Torr. (This plant was from New Mexico. Note that plant / no. 465Z, which also "smelt like citronella" is another species of the same genus, <u>P. filipes</u> Harr. & Gray)	WJD
466 =465D, 467A, 477		
467 This is the series from Cave Creek Ranch:		
A =465D, 466, 477		
B =465C		
C =475G		
D	<u>Heliopsis parviflora</u> Gray	WJD
E	<u>Viguiera multiflora</u> (Nutt.) Blake	WJD
F =475A	<u>Viguiera multiflora</u> (Nutt.) Blake, variant with laciniate rays.	WJD
G	<u>Aster tephrodes</u> (Gray) Blake	WJD
H	<u>Bahia dissecta</u> (Gray) Britton	WJD
J	<u>Heterotheca subaxillaris</u> (Lam.) Britt & Rusby	WJD
	<u>Erigeron neomexicanus</u> Gray	WJD
473 =465F		
475 This is the series of Paradise 'composites' (not all composites):		
A =467F		
B (MALVACEAE)	<u>Sphaeralsea laxa</u> Worton & Standl.	DMB
C (VERBENACEAE)	<u>Verbena bipinnatifida</u> Nutt.	PAH
D (GERANIACEAE)	<u>Geranium eremophilum</u> Woot & Standl.	PAH
E	<u>Psilostrophe sparsiflora</u> (Gray) A. Nels.	WJD
F =465Q		
G =467C		
477 =465D, 466, 467A		
478 =464(1), 465G		
493R2 =463, 464(2), 465B		
493R3 #	<u>Baccharis glutinosa</u> Pers. (Male)	WJD

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LABELS - ARIZ. 1967

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

1. $\frac{1}{2} \times 100 = 50$
 2. $\frac{1}{2} \times 100 = 50$
 3. $\frac{1}{2} \times 100 = 50$
 4. $\frac{1}{2} \times 100 = 50$

[illegible]

2005/12/27
2005/12/27

U.S. DEPARTMENT OF
ENERGY
OFFICE OF
NUCLEAR ENERGY

「我々が山に上ることは、
動物の命を救うことだ」

LABELS FOR ARIZONA FIELD TRIP, 1967(R. SILBERGLIED)
(FOR T. EISNER)

ARIZ: Cochise Co.,
Cave Creek Canyon
(Cave Creek Ranch) 500
September 1967

ARIZ: Cochise Co.,
Cave Creek Canyon
(Cave Creek Ranch) 100
October 1967

ARIZ: Cochise Co.,
road betw. Portal
and Rodeo, N. Mex. 400
September 1967

ARIZ: Cochise Co.,
road betw. Portal
and Paradise 200
September 1967

ARIZ: Cochise Co.,
road betw. Portal
and San Simon 100
September 1967

ARIZ: Cochise Co.,

----- 1967 100
R. Silberglied

at U.V. blacklite
R. E. Silberglied 500

T. Eisner, J. Carrel
and R. Silberglied 400
collectors

TEXAS: Deaf Smith
Co., near Glenrio
15 September 1967 100
T. Eisner, et al.

N. MEX.: Hidalgo
Co., 2 mi. S. of
Road Forks. 100
16 Sept. 1967

TEXAS: Wheeler Co.
Shamrock (at
light) 14 Sep. 1967 200
T. Eisner, et al.

N. MEX.: Dona Ana
Co., eastern slope
of SanAgustin Pass 100
16 September 1967

N. MEX.: Dona Ana
Co., top of San
Agustin Pass, el. 200
5654'. 3 Oct. 1967

T. Eisner
Experiment 200
No.

J. Carrel
Experiment 400
No.

J. Carrel
collector 400

= 48315

associated with Chrysopid Project

- ~~#~~ Sycamore 468 B
- ~~#~~ Chrysopid 468
- Reduviid ^{with} spots 468 A
- Tingido 468 C
- ~~468~~ Mantid 468 D
- Blue Reduviid 468 E
- Loganomyia 468 F
- Spider (anaphenid) 468 G

468 G. Spiders (anaphenids?) versus
Phlephphuphphs (Chrysopid larvae)

21 Sept
13:40

- (1) Spider versus full fluff. 3 ~~#~~
fluffpuffs placed in low cassette with
anaphenid on cut sycamore axil.
- (2) Spider versus defluffed. 3
defluffed fluffpuffs placed in jar
with anaphenid (?) on cut sycamore
axil.
- (3) Same as #2, without leaf,

93

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CHAULIOGNATHUS COMPLEX

PREY:

Chaudio-
gnathus Amico-
ponia

PREDATOR:

Large Red "Sticky" Reduviid + +
20 Sept 3:45 21 Sept 11:00

464. Ch. association of Postal

04

39

468 PE

21 Sept 1967 Anaphenid^(?) spiders versus Phluffpuffs

- 21:10 ① Spider with leaf nest cut to fit, put in cassette. 2 fluffpuffs with fluff placed in web. Spider came out when one of them moved; inspected fluff with palpi, movements with his legs. Then he returned to his tunnel nest in the palmate leaf base.
- 21:15 Repeated a second time.
- 21:16 Repeated a third. Now the second fluffpuff has crawled under the main sheet of the web. The spider is cutting a hole in the sheet surface. It puts its legs thru the hole to inspect the fluffpuff. Returns to upper sheet of web, inspects the larva^(ie, the puff) caught there and then returns to its retreat (tunnel).
- 21:24 Returned to inspect upper larva left in < 1 min.
- 21:29 Returns to puff ~~and~~ (upper) and remains there with legs atop the puff but not doing anything.
- 21:31 Bites puff and gets a chelicer full of fluff. Returns to retreat.
- 21:51 Spider returned to fluff as before, waiting

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PE

with palps + legs on fluff. Returns to retreat after ~1 min.

22:35

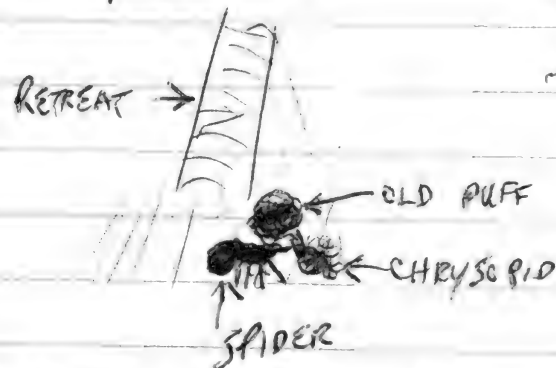
Still in retreat

2:37

Fluffpuff, which was caught by its fluff on the silk web has climbed out of its fluff and is standing on a strand of silk of the web, rebuilding its load with the old fluff.

2:46

Spider comes out of retreat. He is standing betw. the chrysoid, which is trying to reload, and the old pkg.



HE (the spider) is palpating both the old pkg and the anterior part of the reloading Chrysoid.

2:54

Spider now rests with his palps on the thorax of the chrysoid, which is ~~not~~ covered w/ fluff. I can not tell if the spiders cheliterae are on a chrysoid leg; they may be. The puff is about $\frac{1}{3}$ covered w/ fluff, mostly on its abdomen.

3:02

Spider has leg and is feeding

3:14-3:15

4 photos taken, borrowed Kenson lamp
1/5 sec @ f 5.6, 3.5, 2.9, 5.6

21 Sept

39

468 F

21:25

(2) Same as above expt, but with naked larvae dropped in web. Spider rushed out, tunnel was below main sheet. Spider cut hole in main sheet with legs, inspected larva rather closely w/ legs & palps, several times.

21:29

Spider has puff in cheliterae and drags it toward tunnel, thru to bottom of main sheet. Then returns to retreat, without puff. Returns to puff and holds it by the head in its cheliterae. Returns to retreat after 10 min.

21:31

21:51

Still in retreat. Puff still in web, does not move when prodded w/ forceps, and appears to have been sucked dry (appears as a flimsy skin of a larva).

22:35

Still in retreat

22:49

Returned to larva in web

92

21 Sept

39

468 F

- 22:00 (3) Same as #1, spider + 2 fluff/puffs with fluff. This time, puffs just placed on leaf surface instead of in web. Vial used instead of cassette.
- 22:35 Nothing; spider still in retreat.

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21 Sept

39

468

(4) Same as #3, using larvae in/out
 fluff. vial used instead of
 cassette.

22:00

22:35

Nothing; spider still in retreat

PE

21 Sept

39

468 F

- 23:30:00 (5) Naked larva dropped into web of Anapheid (?) in vial, without legs. Larva moved web strands
- 23:30:05 Spider approached larva and touched with legs
- 23:30:20 Spider touched larva w palps
- 23:31:00 Spider bit larva w chelicerae
- 23:34:35 Still holding in same position.
- 2:15:15 larva just a skin, spider returned to refuge under silk.
- 2:17:00 Added a fluffpuff with snuff
- 2:18:00 ~~Spider can~~ larva caught on silk by case
- 2:20:00 Got off silk, wanders about

98

Q

39

- 23:36:35 Fluffy fluffpuff placed in vial w/ large
and small (?) spider.
- 23:50:50 Nothing. Spider has moved about a
few times but not attacked fluffpuff
- 2: 50:00 Nothing. fluffpuff is moving about
rapidly, spider just sits there.

PE

22 Sept

39

(7)

12:45

Placed 2 spiders on cut leaves, with webs,
in cassette, with three fluff/puffs, with
fluff. ~~the~~ The 3 fluff/puffs were placed
on the leaves, not in the webs, &
see if they get caught in webs by them-
selves.

PE

39

21 Sept
22:00

Whipscorpion (small, ~17 mm, not incl. whip)
was placed in small round petri dish w
naked chrysid larva

22 Sept
12:45

Naked ^{larva} dead on plastic bottom of petri dish,
presumed eaten because of crumpled
condition of skin.

12:50

Fully fluffed fluffpuff placed in cassette
with same whipscorpion. Whipscorpion
attacked fluffpuff 4 times, each time
grabbing the moving fluff and pulling it
in towards its chelicerae. Each time
the puff was released.

23 Sept
1:15

Remains of ~~fluff~~ fluffpuff's fluff found
in cassette. Assumed fluffpuff was
eaten.

PE

23 Sept

39

2:00

a crowded cassette of spiders started,
including 2 cut leaves, with
2 nest-building spiders, with
abdominal pattern, and
3 running spiders, yellowish-white

2:02

1 fluffy chrysalid larva introduced
and 1 naked chrysalid larva introduced
onto cover of cassette.

2:10

Naked larva has fallen off cover onto
leaf surface with old web on it, and
is not moving. Fluffy larva is ex-
ploring top of cassette.

PS

23 Sept

39

16:20

Examining leaves and nests of spiders under
binoc. scope. Insects and other arthropods
are found in nests of the marked spider (4)
but the 2 nests of the running yellow spider
that were examined are bare of all arthro-
pods except exuviae of cicadellids and
living cicadellids and mites.

Arthropods found in web nests of marked
spider:

Cecidomyiid flies

Staphylinid beetles

Mites

Cicadellid bugs

Tingid bugs

Chalcidoid Hymenopis

Trichogrammatid wasp

Muscid flies

Calliphorid fly

31

40

26 Sept. 1917

l

p.

m

N

/

40

A

B

C

D

E = Small Dandelion-like head, upright shoot

F = sunflower

G = Chauliognathus flower

26 Sept. 1967

Pix

TAKEN IN FIELD: U.V.

H = Ground-hugging dandelion-like.

f =

distance

last 5

pictures

on a roll

(1) 467 B = 465 C

5.6

5'

(2) 465 I Hymenoptera bush

5.6

4'

(3) 465 J Yellow Desert Aster

5.6

4½'

(4) 465 K Purple Heart

5.6

2'

(5) 465 L Yellow Heart

5.6

3'

New roll

1st 6

picture

(1) 465 D = 467 A

4

4'

(2) 465 D = 467 A

5.6

4'

(3) 465 M White purple heart

5.6

2'

(4) 465 N Green 3-horned + Chauliognathus bush

5.6

2'

(5) 465 N Green 3-horned

5.6

4'

Letter
"O" skipped →

(6) 465 P Yellow Dingleberry

8

1.8'

(6) was also shot in color, f16 @ 1.8' (knife in picture)

23 Sept SPIDERS vs. CHRYSOPID LARVAE 39
 12:30 Eight cassettes set up, as follows.

CHRYSOPID LARVA

1 leaf web	WEB- SPINNING SPIDER	2 WITH fluff
2 leaf web		2 WITH FLUFF
3 leaf web		2 NO fluff
4 leaf web		2 NO fluff
5 no leaf web	RUNNING SPIDER	1 WITH FLUFF
6 no leaf web		1 NO FLUFF
7 no leaf web		1 WITH FLUFF
8 no leaf web		1 NO FLUFF

~~All spiders~~ All web

Spiders 1-4, collected at Cave Cr. Ranch
 23 Sept 1967 about noon, on Sycamore
 Spiders 5-8, collected at Cave Cr. Ranch
 22 Sept 1967 on Sycamore

Natural prey seen in webs includes:

web #	prey
1	1 muscid fly
2	1 homopt. nymph.
3	1 chalcid fly
4	2 muscid flies + 2 cecidomyiids

all above nests had evidence of fluff.

23 Sept

PE

22:30

LEAF NESTER, WITH LEAF NEST,
VS. 2 FLUFFY LARVAE
START

24 Sept

11:20

Both larvae alive, with full fluff;
Spider still in nest.

19:35

One larva in web has pupated.
The other larva is under some
strands ~~and~~ of the web and is
apparently trapped. The spider
shows no interest and is in its retreat.

25 Sept

16:57

Same as before; trapped larva has freed
itself and left some fluff in the web.

26 Sept

13:22

Same as 25 Sept. Spider in retreat, one
larva free and moving, other in web
as pupa

21:53

Same as last time, except spider has
left retreat.

27 Sept

12:36

Same as before. Spider in retreat

~~28 Sept.~~

29 Sept

00:59

Spider left retreat; spun on other side of
leaf; larva still alive but left more fluff
in fresh strands.

2 OCT

3:35

Spider in retreat; both larvae have
pupated. TERMINATED

23 Sept

(2)

22:30

LEAF NESTER, WITH LEAF NEST,
VS. 2 FLUFFY LARVAE
START

39

24 Sept

11:21

One larva caught by fluff on underside
of web in silk of web. The other has
apparently lost some fluff to silk strands
on the edge of the web, where it
is standing and struggling against
one silk strand that is loose from
the web where the leaf was cut.
Spider still in retreat of web
Spider still in retreat; both larvae
are free and moving.

19:37

25 Sept

17:00

Both larvae alive + moving. One has
lost some fluff. Spider has left
retreat and hides under leaf, but not
near larva.

26 Sept

13:23

Same as 25 Sept. Both alive and moving.
Spider has new web between cassette + leaf.
One fluffpuff was observed to cut spider silk
thread ^(with mandibles) that held it restrained.

21:54

One larva is on side of cassette, alive +
moving; other is on surface of web,
also alive. Spider is on web, not in retreat

27 Sept

12:38

Spider not in retreat, but on side of cassette one larva
alive + moving; other dead on other side of leaf, apparently
pucked dry, probably by 1st larva.

23 Sept

LEAF NESTER, WITH LEAF NEST, VS
2 NAKED LARVAE

(3)

22:30

START

22:32

LARVA WANDERED INTO WEB AND SPIDER REACTED BY ATTACKING IT WITH ITS LEGS AND PALPI WAVING FURIOUSLY. LARVA CONTINUED TO STRUGGLE IN WEB AS SPIDER PALPATED IT. SPIDER SUDDENLY RETURNED TO WEB RETREAT.

24 Sept

12:31

One larva found dead on bottom of cassette. No silk on it, apparently sucked dry. Other larva half dressed (removed the fluff).

19:40

Same as before. I removed some fluff the larva had accumulated.

25 Sept

17:52

Same as before. (removed some fluff the larva had accumulated.

26 Sept.

13:28

Same as 25 Sept. Fluff removed

21:55

Same as above. Dead chrysid 3 now incorporated into fluff of live one. Fluff and chrysid ^{skin} now removed so larva is now naked. Spider in retreat.

27 Sept

12:41

Same as before. Fluff removed.

29 Sept 1:00

Same as before. Fluff removed. Spider out of retreat.

2 OCT 3:38

Same as before, but larva pupated.

23 Sept

LEAF NESTER, WITH LEAF NEST, VS 2 NAKED LARVAE

(4)

22:30

START

24 Sept

12:33

Both larvae alive and partly redressed. I have just removed their fluff again. Spider still in retreat.

19:43

Both larvae alive ~~and~~ but sluggish. Spider still in retreat.

25 Sept

17:06

One larva alive and I removed some fluff it had accumulated. Other is in web and is dead and black. (examined by T. E. Brier) ^(NOT EATEN)

26 Sept

13:29

Same as 25 Sept. Fluff removed.

21:59

Same as above. Fluff removed.

27 Sept

12:44

Same as before, except larva inactive and appears ready to pupate.

29 Sept 1:01

Spider out of retreat, new web strands on side of cassette. Other larva dead; apparently NOT sucked dry. TERMINATED

39

23 Sept

(5)

22:30

LEAF NESTER, WITHOUT WEB,
VS. FLUFFY LARVA

START

24 Sept

11:45

Fluffpuff caught by fluff in webbing and is suspended in midair.

12:38

Some of fluff has been lost to another strand of silk in web. Spider still span in against side of cassette

19:45

Larva is caught in web but very sluggish; appears ready to pupate. Spider uninterested and in retreat.

25 Sept

17:08

Fluff still in web. Spider still in retreat. Larva is now flaked, and is caught in another part of web, alive. (Examined by T. Eisner)

26 Sept

13:31

Fluff still in web, larva is now dead, in same part of web as before, apparently sucked out. Spider in retreat TERMINATED

(2), CONTINUED.

29 Sept; 00:59

SPIDER NOT IN RETREAT; NEW WEB ON SIDE OF CASSETTE. LARVA ALIVE UNDER NEW STRANDS AND HAS LOST SOME FLUFF IN NEW WEB.

2 OCT. 3:36

SPIDER IN NEW WEB. LARVA IN WEB DEAD, APPARENTLY SUCKED DRY. TERMINATED

23 Sept

(6)

22:30

LEAF NESTER, WITHOUT WEB,
VS. ~~FLUFFY~~ NAKED LARVA

START

24 Sept

12:41

Larva alive and quiet on bottom of cassette. Spider against side of cassette, not near larva.

19:46

Same as before. ~~Sp~~ Larva seems to have some silk attached to it.

25 Sept.

17:10

Larva dead in web, black and apparently sucked dry. TERMINATED

39

23 Sept

RUNNING SPIDER VS FLUFFY LARVA (NO LEAF)

22:30

START

24 Sept

~~22:30~~ 11:45 Larva is suspended in midair directly below where spider has spun its retreat. It has lost much fluff in web, and even more below itself on bottom of cassette.

12:44

Larva has lost more fluff to bottom of cassette. It is pulling fluff off its back with great effort, dropping it below itself in a pile.

13:05

Pictures taken, web broken. Spider taken out. Webbing with larva hung on side of cassette. It now is upside down and has a foot-hold on the silk.

13:19

Larva has released itself. Spider replaced.

19:47

Larva suspended in midair by fluff. Spider active but not near the alive & struggling larva. Larva is pulling out fluff, as before.

25 Sept

17:12

Larva is dead but apparently not sucked dry (appears rather solid, T. Eisner). Still suspended by fluff in midair. (examined by T. Eisner)

TERMINATED

23 Sept

RUNNING SPIDER VS NAKED LARVA (NO LEAF)

39

8

22:30

START

24 Sept

12:56

Larva has somehow managed to get itself suspended in midair by several strands of silk of the web. It is upside down and struggling to cut threads of the web with its mandibles. Spider is spun in retreat on side of cassette.

13:10

Photos taken, web broken. Larva is still caught in silk, but is on threads suspended from cassette top while being upside down on the bottom of the cassette.

19:49

Larva stuck to silk on bottom of cassette. Spider active but not interested.

25 Sept

17:30

Spider is in retreat; larva as before, appears ready to pupate (examined by T. Eisner)

26 Sept

13:35

As before (25 Sept).

TERMINATED

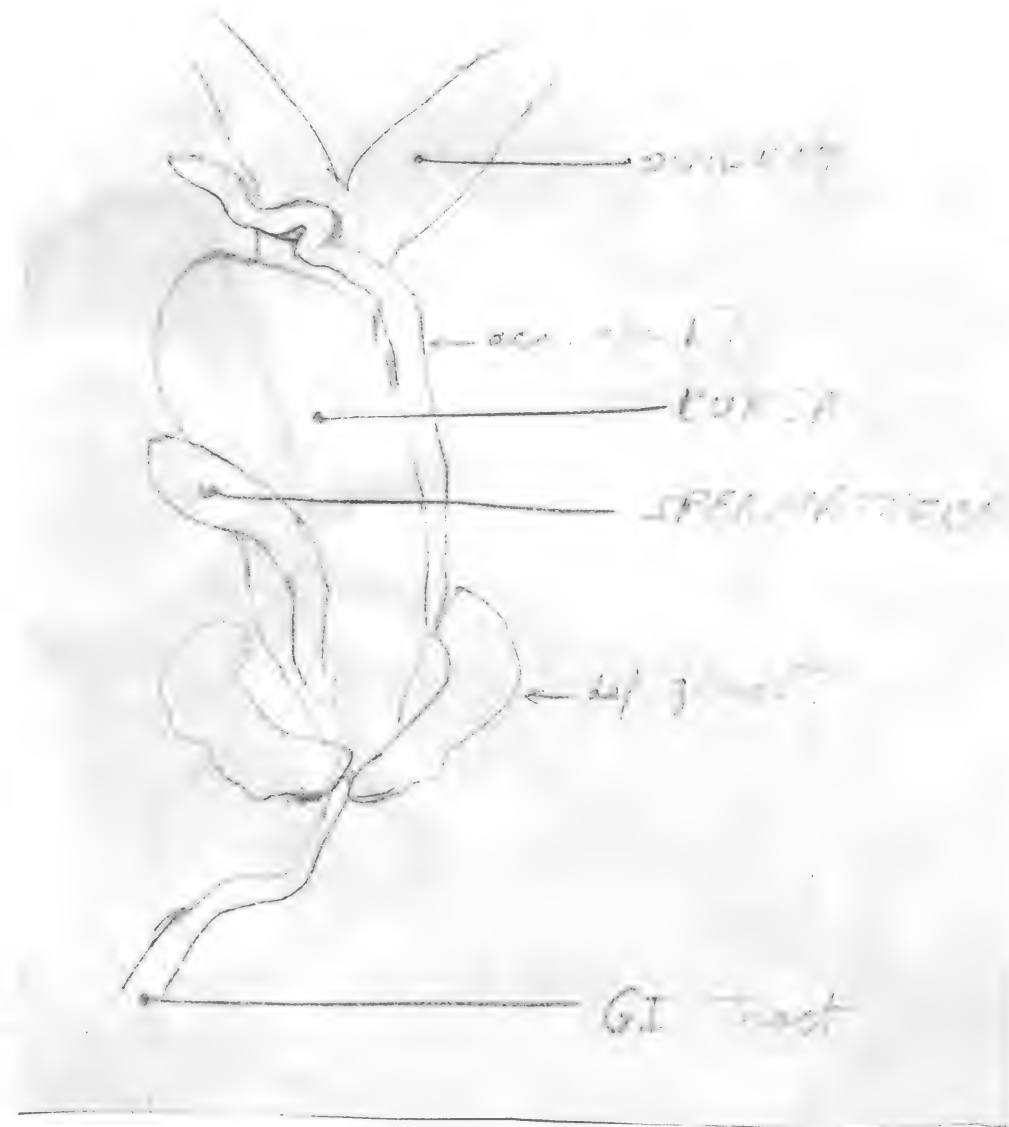
exp. continued on p. 40

93

42

24 Sept 1967

Chaetognaths ♀ genital system.
coll. Portal Road.



45

42 ps

26 Sept. 1967

CHAULIOGNATHUS PRONOTAL PATCH

13:05 4 Chauliognathus, 3 ♀♀ and 1 ♂, ~~found~~
(coll. vic. Portal-Ladeco Rd 24 Sept '67
by sweeping from car, R.S.) were placed
on goldenrod under a net bag closed
w/ a string. All 3 ♀♀ had
distinct pronotal patches.

39

SUMMARY OF EXPERIMENTS WITH CHRYSOPID LARVAE

Arizona, 1967

R. Silberglied

VERSUS ARMY ANTS (Neivamyrmex sp.)

2 fluffpuffs, 1 naked, 1 with fluff, were placed in trail of ants in a plastic cassette. Naked one ~~was~~ stung; immobile in 5 minutes. One with fluff alive and moving 1 hr & 10 min. later.

Same experiment repeated. After 18 min. the naked one is on its back, stung and immobile. One with fluff alive & moving.

PREY OF LEAF-NESTING SPIDERS FOUND IN WEBS (NATURAL)

8V-2-7

SPIDERS VERSUS CHRYSOPID LARVAE

12 cassettes set up as

1	leaf web	we
2	leaf web	we
3	leaf web	we
4	leaf web	we
5	no web	we
6	no web	we
7	no web	ru
8	no web	ru
9	leaf web	we
10	leaf web	we
11	leaf web	we
12	leaf web	we

Cumulated data:

	alive
WITH FLUFF	1
NO FLUFF	2

VERSUS A WHIPSCORPION

Small whipscorpion (about 17
found petri dish with naked
naked larva found dead on bo
because of crumpled nature of

Same whipscorpion placed in
Whipscorpion observed to attack
the moving larva with its ped
shelicerae. Each time the flu
later remains of larva's fluff
it was eaten.

39

39

39

SUMMARY OF EXPERIMENTS WITH CHRYSOPID LARVAE

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Same experiment repeated. After 18 min. the naked one is on its back, stung and immobile. One with fluff alive & moving.

PREY OF LEAF-NESTING SPIDERS FOUND IN WEBS (NATURAL)

"Yellow running spider": nests bare except for mites, cicadellids (alive), and cicadellid exuviae

"Marked, leaf nesting spider": "Sycamore-fluff" found in webs, plus: -Arthropods found in webs included:

Cecidomyiid flies
Staphylinid beetles
Mites
Cicadellid bugs
Tingid bugs
Chalcidoid hymenopterans
Trichogrammatid wasp
Muscid flies
Calliphorid fly

ed data:

FLUFF

FLUFF

alive

1

2

IPSCORPION

Chipsorpion (about 17 petri dish with naked larva found dead on bottom of crumpled nature of

Chipsorpion placed in petri dish with its pedicel. Each time the fly remains of larva's fluff is eaten.

SPIDERS VERSUS CHRYSOPID LARVAE

12 cassettes set up as

1 leaf web we
web we
web we
web we
web we
web we
web we
web we
web we
web we
web we
web we

39

39

SUMMARY OF EXPERIMENTS WITH CHRYSOPID LARVAE

Arizona, 1967

R. Silberglied

VERSUS ARMY ANTS (*Neivamyrmex* sp.)

2 fluffpuffs, 1 naked, 1 with fluff, were placed in trail of ants in a plastic cassette. Naked one ~~was eaten~~ and stung; immobile in 5 minutes. One with fluff alive and moving 1 hr & 10 min. later.

Same experiment repeated. After 18 min. the naked one is on its back, stung and immobile. One with fluff alive & moving.

PREY OF LEAF-NESTING SPIDERS FOUND IN WEBS (NATURAL)

SPIDERS VERSUS CHRYSOPID LARVAE

12 cassettes set up as follows:

1	leaf web	web-spinner	2	larvae with fluff
2	leaf web	web-spinner	2	larvae with fluff
3	leaf web	web-spinner	2	larvae; no fluff
4	leaf web	web-spinner	2	larvae; no fluff
5	no web	web-spinner	1	larva with fluff
6	no web	web-spinner	1	larva; no fluff
7	no web	running spider	1	larva with fluff
8	no web	running spider	1	larva; no fluff
9	leaf web	web-spinner	2	larvae with fluff
10	leaf web	web-spinner	2	larvae with fluff
11	leaf web	web-spinner	2	larvae; no fluff
12	leaf web	web-spinner	2	larvae; no fluff

Cumulated data:

	Alive alive & moving	pupated	Dead sucked dry	not eaten
WITH FLUFF	1	4	4	1
NO FLUFF	2	3	3	2

Result:

Both pupated
Both dead, sucked dry
One dead & sucked dry,
other pupated
Both dead, but not eaten
Dead, sucked dry
Dead, sucked dry
Dead, not eaten
Pupated
One alive, other pupated
Both pupated
Both alive
One dead & sucked dry,
other pupated.

VERSUS A WHIPSCORPION

Small whipsorpion (about 17 mm, not incl. whip), placed in small round petri dish with naked Chrysopid larva. 14 hr., 45 min. later naked larva found dead on bottom of petri dish, assumed eaten or killed because of crumpled nature of skin.

Same whipsorpion placed in cassette with fully fluffed larva. Whipsorpion observed to attack larva 4-times, each time grabbing the moving larva with its pedipalps and pulling it in towards its chelicerae. Each time the fluffpuff was released alive. 24 hr., 25 min. later remains of larva's fluff found in cassette; no larva. Assumed it was eaten.

43

SE

43



(WALL STONES)

(SOME STONE SPOTS)

sides

1. 200 ft

EH

- 1.
- 2.
- 3.
- 4.

Low

Scat

Low

Perip

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4. describe all

Biol. Note 16 (Gnasia) Parasite.

Exp. Nos. WITHOUT SPECIMENS:

283. Papilionids (*Aristolochia*) caterpillars.

286 Caterpillar vs. centipede

288 Elaterid vs "

289 " vs solpugid

290 Brachystola - tibial spurs (specimen, not #4)

292 State Line Road QUEEN.

294 Queen hair pencil secretion

~~296 Potted Redwood Ms. Matlock~~

297. *Psymachus* (CER)

298 " vs elaterid

299 *Triatoma*? (CCR-UV) vs elaterid

OVER

39

Chrysopid 468 = Chrysopa perfecta Banks
 Specimens held by Ellis McLeod
 other eggs are Tomanysa sp.
 up in Crysopa

39

26 Sept.
 16:25

SPIDERS vs. CHRYSOPID LARVAE
 CONTINUED FROM p. 31-35
 4 Cassettes set up as follows:

39

- (1) all cassettes have one spider in leaf web
- (2) First 2 cassettes have 2 larvae, with fluff, in each (#9, 10).
 Second 2 cassettes (#11, 12) have 2 larvae, without fluff (naked) in each.

9	} 2 larvae ea. + fluff	} web spinning spider +
10		
11	} 2 larvae ea, naked	} leaf nest.
12		

26 Sept
9

LEAF NESTER w/ LEAF NEST
vs 2 FLUFFY LARVAE

16:25

START

21:40

NO ACTION. 2 FLUFFS FREE + MOVING.
SPIDER IN RETREAT

27 Sept.

SPIDER IN RETREAT. BOTH FLUFFY LARVAE

12:48

ALIVE + MOVING. ONE IS UNDER
SILK STRANDS OF WEB AND HAS
LEFT TRAILS OF FLUFF.

29 SEPT

1:09

SPIDER HAS NEW RETREAT ON SIDE OF
CASETTE; ONE LARVA HAS PUPATED
IN WEB; OTHER HAS LOST FLUFF
AND IS SUSPENDED IN WEB IN MIDAIR.

2 OCT

3:41

SAME AS 29 SEPT. ONE LARVA
STILL ALIVE ^{+ MOVING}
(other pupated) TERMINATED

LEAF NESTER w/ LEAF NEST
vs 2 FLUFFY LARVAE

10

26 Sept

START

16:25

21:45

NO ACTION. SPIDER IN RETREAT. 2
LARVAE FREE + MOVING.

27 Sept

12:49

BOTH LARVAE ALIVE + MOVING;
SOME FLUFF SEEMS TO HAVE
BEEN LOST IN WEB THAT WAS
FRESHLY SPUN BETWEEN LEAF
AND CASETTE. SPIDER IN RETREAT.

29 SEPT.

1:17

ONE LARVA PUPATED IN WEB; OTHER
- ALIVE + MOVING ON LEAF. SPIDER IN
RETREAT

2 OCT

3:43

BOTH LARVAE NOW PUPATED.
SPIDER IN RETREAT
TERMINATED

39

(11)

LEAF NESTER w/ LEAF NEST
vs 2 NAKED LARVAE

26 Sept

16:25

START

21:48

NO ACTION. SPIDER HAS LEFT
RETREAT. BOTH LARVAE ALIVE &
MOVING; SOME FLUFF REMOVED
THAT THEY ACCUMULATED

27 Sept

12:51

SPIDER HAD BUILT NEW RETREAT
ON TOP OF CASSETTE; DESTROYED
WHEN CASSETTE OPENED. BOTH LARVAE
ALIVE & MOVING, I REMOVED THEIR
ACCUMULATED FLUFF.

29 SEPT.

1:20

SAME AS ABOVE; RETREAT DESTROYED,
BOTH LARVAE ALIVE; FLUFF REMOVED.

2 OCT

3:44

BOTH LARVAE ALIVE & MOVING,
SPIDER IN RETREAT
TERMINATED

(12)

LEAF NESTER w/ LEAF NEST
vs 2 NAKED LARVAE

39

26 Sept.

16:25

START

21:49.

SPIDER IN RETREAT. CHRYSOPIDS
ARE (1) BELOW SHEET OF WEB,
WHERE IT IS LOADING w/ FLUFF
AND CICADELLID NYMPHAL SKINS, AND
(2) ON SIDE OF CASSETTE WITH ACCUM-
ULATED FLUFF. I REMOVED ALL
ACCUMULATED FLUFF.

27 Sept.

12:54

SPIDER IN RETREAT. BOTH
LARVAE ALIVE & MOVING.

29 SEPT

1:23

SAME AS BEFORE; BOTH LARVAE ALIVE
& MOVING; FLUFF REMOVED; SPIDER IN
RETREAT.

2 OCT

3:45

~~BOTH~~ ONE LARVA PUPATED -
THE OTHER DEAD ON BOTTOM
OF CASSETTE & APPARENTLY
SACKED DRY. TERMINATED

39

CUMULATED SPIDER DATA.

WITH

FLUFF (10)

1 4 4 1

WITHOUT

FLUFF (10)

2 3 3 2

ALIVE +
MOVING

PUPATED

EATEN
~~BY SPIDER~~

NOT
EATEN

ALIVE

DEAD

28 SEPT.

NAMES OF INSECTS OF PORTAL AREA
TO BE CHECKED AGAINST THOSE
COLLECTED AND LARGE COLLECTIONS.

ORTHOPTERA:

Bright colored ACRIDID: Dactalotum variegatum

Crested green ACRIDID: Trapidolophus formosus

Taeniopoda is egues

Brachystola is magna

Giant TETTIGONIID: Capnobates fuliginosus

Small Desert TETTIGONIID: Dichopetala brevipastata

COLEOPTERA:

Bright Desert ~~Teneb~~ CLERID: Trichodes horni

Smooth, margined TENEB: Euschides rimatus

Rough, margined TENEB: E. sp.

Freezing or Running TENEB: Pelecyphorus morbillosus

Hemispherical TENEB: Discoderus reticulatus

Pepsis-mimic CERAMBYCID: Tragidion sp.

Chauliognathus mimicing CERAMBYCIDS:

Tylosus maculatus

Crossidius pulchellus

Tetraopes femoratus [BIG + RED]

Tetraopes discoidens [GRAY]

see also: Anoplodera spp.

MISCELLANEOUS:

TABANID @ UUBL sheet: Tabanus dorsifer

REDUVID that feeds [DET. A. STONE]

on Chrysopid Larvae: Pselliopus

Big Red (sticky) REDUVID: Apiomerus

HYMENOPTERA - BUSH = BACCHARIS.

Courtesy A.M.N.H. ref. colln.

@ S.W. Res. Sta.; in particular,

courtesy Vince Roth.

Also: Large black + red meloid = ~~Pezomachus~~ Megestra

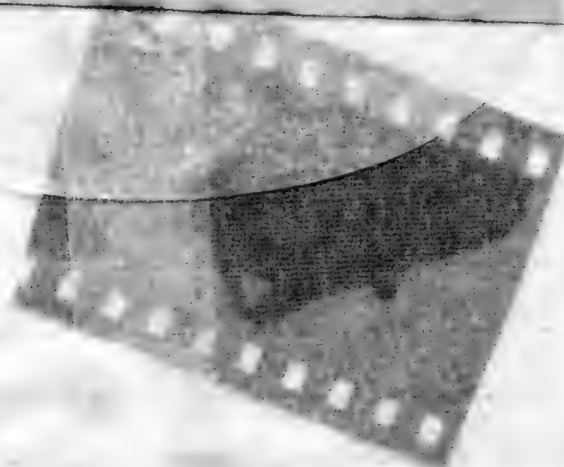
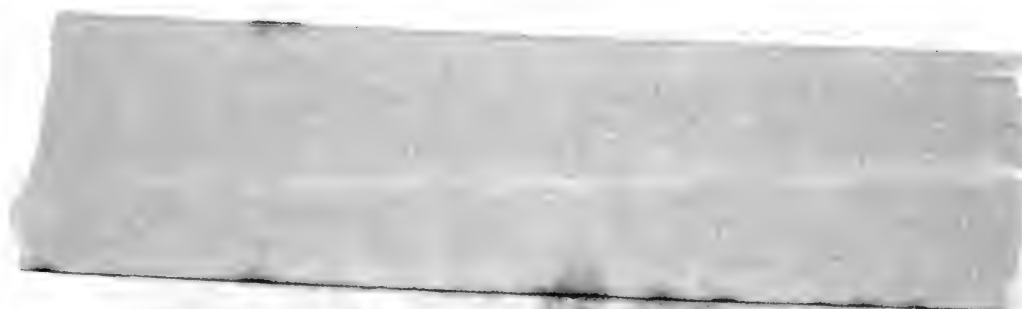
cancellata championi VanDyke

Black meloid that mimics (?) freezing TENEB:

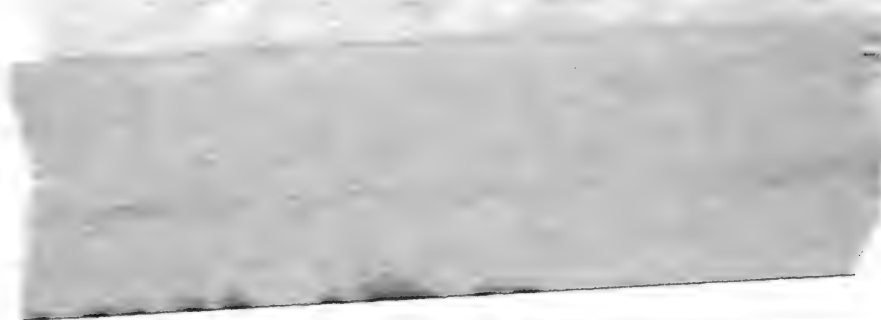
Epicauta corvina Clec.

43

41



Small, illegible text or stamp, possibly a date or a signature.





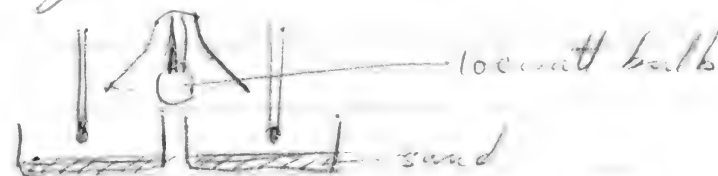
1A

45°

12 Dec. 1967.

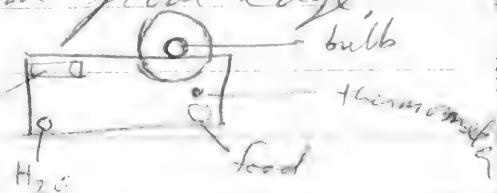
20:32

Two identical cages set up
with $\frac{1}{2}$ to $\frac{3}{4}$ sand; Pabulum
must be on a small Petri dish
center; one large 12-dram vial, clean
and without top; and test tube
of distilled water with sponge top,
inverted and hang from side of cage.
Cages are 8x12 white plastic.
~~are~~ 100 watt bulb shines on both
cages and its light & heat
are evenly divided between them.



Thermometers in both cages 1 cm
above sand and 40 cm from edge,
records temp. °C.

p. 46 has temperatures
recorded



42

45

Date	Time	°C	°F	Comments	Date	Time	°C	°F	Comments
		R/L	R/L				R/L	R/L	
12 Dec	17:45	31	88	turned on 9:30					
2 Dec	20:32	35/35	94	steady					
13 Dec	17:30	35/35	94						
13 Dec	18:00	35/35	94						
14 Dec	00:34	35/35	94						

12 Dec. Two beetles added to each cage, 2 ea.

10.32 R has normal Eleodes longicollis,
 L has 2 Eleodes longicollis that had
 their elytra removed on 8 Dec. 1967.
 Until this time they have been in a cage
 with "normal" Eleodes longicollis, and,
 although not observed continually, showed
 no obvious differences in behavior
 from the "normals". They would mate
 & be mated, etc.

L 401 DS

44

8 Feb 1968 I have had 8 larvae of *Tylos*
 9:45 AM that I kept since Arizona, in
 Sept 1967, when they were
 collected. All were found on Cave
 Creek on Cave Creek Ranch,
 along the stream bed.

Emergences:

	<u>pupated</u>	<u>emerged</u>	<u>died</u>
1 ♂	late Dec.	early Jan	late Jan
1 ♂	late Jan	early Feb	15 Feb
1 ♂	before 5 Feb	18 Feb '68	
1 ♀	{ betw 12 midnight and 9:45 AM, Feb 7-8 }	23 Feb '68	
1 ♀	{ betw 12 midnight and 10:30 AM, Feb 18-19 }	{ 3 Mar '68 ~ 8 PM }	{ Mar '68 (killed) }
1 ♀	6-7 March 1968	10-12 Mar '68	

1 ♂ 10-12 Mar 1968

1 ♂ 10-12 Mar 1968

1 ♀? 12-14 Mar 1968 20 Mar '68

31 March 1968
~~April~~

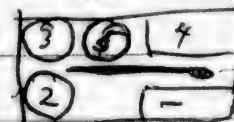
EXPT # 45

Experiment to test hypothesis: Does the presence or absence of elytra on the backs of Tenebrionid beetles confer any survival advantage under hot, or dry, or both, conditions

Materials

45 Eleodes sp.?, second generation, all progeny of Eleodes sp.?, collected at Cave Cr. Ranch, v.c. Patal, Arizona, Sept 1967; progeny all emerged within 5 days of one another; larvae were reared in same containers and underwent same cooling period to break diapause. All now about 1 month old.

5 containers, 3 round, 2 square, all filled w/ about 3/4 inch of sand.



thermometer

1 large container holding above containers, and thermometer

1 thermometer, °C = -10 to 150.

42

45

Method



Adults prepared by

- (1) pinning down on protein block, venter up
- (2) cutting around as follows
 1. elytra cut off
 2. elytra cut off + replaced, cemented
 3. elytra cut around but not off
 4. elytra intact
 5. elytra w/ hole cut in top, ~1 cm in diam.
- ~~(3) beetles put into containers, ^{apiece}~~
- (3) beetles rinsed w/ distilled H₂O
- (4) beetles put into containers, one apiece


31 Mar.
17:00 hr.

45

- #1. placed ^{and pinned} on back, elytra cut around;
turned over on belly to remove.
beetle washed, put in container;
beetle discharged quinine during operation.
- #2. placed & pinned on back; elytra cut
around, turned over on venter to
remove ^{the elytra} in one piece; elytra soft
at humeri and curled over;

femal cement applied 
to all edges except apex, placed
on beetle affixed to cork, 
cement fused all around,
except apex (last 2 sternites)
w/ hot needle. beetle washed,
put in container. beetle discharged
during operation; it also injured
right prothoracic leg @ fibro-femoral
joint.

- #3. placed & pinned on side on protein
block, left side cut; right side
done in hand, beetle cut all
around except @ base

beetle washed + 
placed in cassette.
beetle discharged quinine during
operation.

#4. beetle pinned down on venter,
left under light; then on dorsum,
left under light; washed off
and placed in container.
Beetle has tibia of left metathoracic
leg broken w/ distal part missing,
also has same for left mesothoracic
leg's tarsus. Beetle did not discharge
quinones although (tried to make it do so).

#5 beetle pinned on venter and
1 cm diam hole cut in dorsum
of elytra. beetle washed and
put into container. Beetle discharged
quinones while being washed

→ Squeezed legs w/ forceps
opened oper of abd. w/ forceps

31 Mar. (800 hr. — large container put
under gooseneck lamp.

24


45

date	time	temp °C	°F
31 Mar	18:00	25	76
	19:00	30	86
	20:00	32	90
1 April	10:00	32	90
	20:00	32	90
2 April	17:00	32	90
3 April	10:30	32	90
4 April	11:50	31	87
	22:35	30	86
5 April	23:10	31	87
8 April	10:55	32°	90
9 April	10:45	33°	
11 April	12:50	34°	

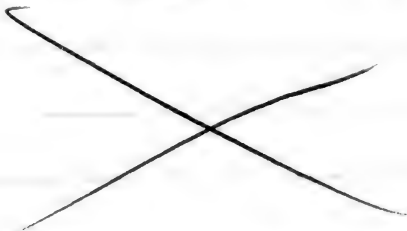
DEAD

- 45
- #1 1 April 20:00 alive and O.K.
 2 April 17:00 dead, tissues shrunken



- #2 1 April 20:00 alive and O.K.
 2 April 17:00 alive & O.K.
 3 April 10:30 alive & O.K.
 4 April 00:20 alive & O.K.,
 right foreleg seems crippled,
 doesn't bend at femur-tibia joint.
 22:35 alive, sluggish,
 antennae curled under at
 apices 

5 April 23:00 dead



#3

1 April, 12:00. on back, legs and antennae shaking and quivering

1 April, 20:00 still on back & quivering

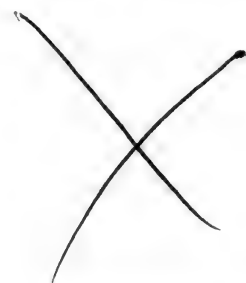
2 April 17:00 dead, on back



#4

1 April 20:00 alive and O.K.

2 April, 17:00 dead, dried out (fizziness)



#5

1 April 20:00 alive and O.K.

2 April 17:00 alive and O.K.

3 April 10:30 alive and O.K.

4 April 00:20 alive and O.K. covered w/ sand particles on pronotum and elytra

4 Apr, 11:50 alive and O.K.

4 Apr. 22:35 alive and O.K.

5 Apr. 23:10 alive & O.K.

9 April 23:45 dead

I 0 6 12 18
 II 0 6 12 18
 III 0 6 12 18
 IV 0 6 12 18
 V 0 6 12 18

① ELYTRA REMOVED

② ELYTRA REMOVED, REPLACED + SEALED

③ ELYTRA CUT AT SIDES

④ ELYTRA INTACT

⑤ ALL 13 TO 31st HOLE IN TOP OF ELYTRA



24

3 April 1968

EXPT # 46

11:15:00

4 *Eledes* spp. from San Agustin
Pass, N. Mex., 3 Oct. 1967 (— R.S.),
were prepared as follows.

Each beetle was fitted with a number
(#1, 2, 3, 4) glued on the dorsum of the
prothorax with feral cement, using
a hot needle.

~~Beetles were~~

Beetle #1 — elytra intact

~~Beetle #2 — elytra removed~~

Beetle #2 — ~~elytra~~ hole made in
elytra about 5 mm. in
diameter

Beetle #3 — same as no. 2, but
piece of elytron glued ~~to~~ over
~~to~~ the hole with feral
Cement.

Beetle #4 — same as no. 2 but
piece of transparent plastic
glued in place with feral cement.

Beetles put into container they
came from after being washed w/
distilled water.

21:00 put all beetles into cassettes ~~in~~
~~a bin~~ (6.7 x 6.7 x 12.5 cm)
 (clear plast. c) w/ < 1 cm sand in
 bottom and small card for shade
 in a large plastic box,
 approx 10" x 13" x 4". Each beetle
 weighed (see next page). Thermometer
 added and put under a 60 watt
 incandescent lamp in a goose-neck
 base, ~ 2 cm from top of case

3 April	23:00	27°C	(80°F)
4 April	00:30	36°C	(96°F)

moved lamp to 3.5 cm from top of
 case

4 April	10:30	36°	(96°F)
---------	-------	-----	--------

~~moved lamp to 8 cm from top of box~~
~~removed box for weighing~~
 { (see 2 pages after this) (p 61)
 temperature during weighing
 11:00 24.5°C (°F)

11:50 put back under lamp,
 (60 w) at 8 cm betw/ box and lamp.
 12:30 33°C (91°F)
 17:40 35°C (95°F)

24

46

3 APRIL > Weights of beetles at beginning of
20:00 test.

608 606
- 641

 4 42

<u>tare</u>	<u>1</u>	<u>tare</u>	<u>2</u>
5.64133	6.08834	5.64158	6.02667
5.64136	6.08834	5.64169	6.02662
5.64137	6.08832	5.64163	6.02660
5.64137	6.08833	5.64168	6.02662
5.64139	6.08831	5.64164	6.02656
(28.20682)	(30.44164)	(28.20822)	(30.13307)
<u>tare</u>	<u>3</u>	<u>tare</u>	<u>4</u>
5.64252	6.11707	5.64309	6.02178
5.64247	6.11702	5.64310	6.02179
5.64253	6.11696	5.64303	6.02172
5.64245	6.11690	5.64302	6.02171
5.64250	6.11692	5.64304	6.02168
(28.21247)	(30.58487)	(28.21528)	(30.10868)
<u>tare</u>			
5.64282			
5.64281			
5.64291			
5.64302			
5.64298			
(28.21454)			

2A

46

4 APRIL

11:00

<u>tare</u>	<u>1</u>	<u>tare</u>	<u>2</u>
5.64206	6.06243	5.64252	5.98941
5.64214	6.06236	5.64248	5.98943
5.64219	6.06238	5.64247	5.98941
5.64218	6.06234	5.64243	5.98940
5.64256	6.06235	5.64248	5.98935
5.64252	(30.31186)	(28.21238)	(29.94700)
5.64253			
5.64254			
5.64257			
(28.21272)			

<u>tare</u>	<u>3</u>	<u>tare</u>	<u>4</u>
5.64255	6.08704	5.64320	5.99232
5.64256	6.08701	5.64318	5.99232
5.64259	6.08698	5.64315	5.99232
5.64271	6.08697	5.64310	5.99231
5.64266	6.08694	5.64308	5.99232
(28.21307)	(30.43494)	(28.21571)	(29.96159)

tare

5.64309
 5.64307
 5.64310
 5.64309
 5.64311
 (28.21548)

34

46

4 April 22:35 33°C (°F)
 23:15 30°C (86 °F)

23:15 removed for weighing, see p. 64
 23:55 back to light [at 24.5°C]
 23:55 24.5°C (°F)

5 April
~~23:30~~ 23:30 33°C (°F)
 removed and weighed, see p. 65

put back to light
 23:55 24.5°C (°F)

8 April 10:55 34°C (°F)

#2 and 3 are dead

removed and weighed @ 11:00.
 see p. 66.

put back to light
 12:30 25°C (°F)

9 April 23:30 32°C (°F)
 weighed, see p. 69. #4 dead. Put back at 2

10 April 00:05 24.5

11 April 12:55 33°C (°F)

weighed (220) all are now dead. terminated

24

46

4 April
23:20

<u>lane</u>	<u>1</u>	<u>lane</u>	<u>2</u>
5.64131	6.04773	5.64184	5.96269
5.64139	6.04776	5.64158	5.96272
5.64146	6.04784	5.64166	5.96275
5.64152	6.04791	5.64167	5.96276
5.64154	6.04792	5.64170	5.96270
5.64162	(30.23 916)	(28.20815)	(29.81632)
5.64164			
5.64162			
5.64171			
(28.20813)			

<u>lane</u>	<u>3</u>	<u>lane</u>	<u>4</u>
5.64162	6.06526	5.64188	5.97239
5.64168	6.06528	5.64191	5.97240
5.64190	6.06534	5.64194	5.97252
5.64192	6.06535	5.64202	5.97256
5.64198	6.06543	5.64204	5.97258
(28.20910)	(30.32666)	(28.20979)	(29.86245)

<u>lane</u>
5.64188
5.64190
5.64196
5.64202
5.64204
(28.20980)

dt

46

5 April tare

23.30

1

tare

2

5.64084	6.01886	5.64099	5.92268
5.64096	6.01889	5.64106	5.92273
5.64113	6.01890	5.64107	5.92278
5.64114	6.01894	5.64112	5.92280
5.64121	6.01893	5.64117	5.92287
5.64123		(28.20541)	(29.61386)
5.64129	(30.09452)		

5.64135

5.64138

(28.20541)

tare

3

tare

4

5.64187	6.02382	5.64210	5.94858
5.64190	6.02386	5.64218	5.94859
5.64195	6.02395	5.64221	5.94868
5.64198	6.02397	5.64225	5.94864
5.64206	6.02392	5.64228	5.94867
(28.20916)	(30.11952)	(28.21102)	(29.74316)

tare

5.64269

5.64272

5.64278

5.64283

5.64285

(28.21387)

JA

46

8 April 1200

fare

1

fare

(DEAD)
2

5.64339	5.94903	5.64434	5.81348
5.64338	5.94901	5.64432	5.81348
5.64341	5.94901	5.64429	5.81346
5.64342	5.94900	5.64424	5.81354
5.64341	5.94902	5.64420	5.81353
(28.21701)	(29.74507)	(28.22139)	(29.06749)

fare (DEAD)
3

fare 4

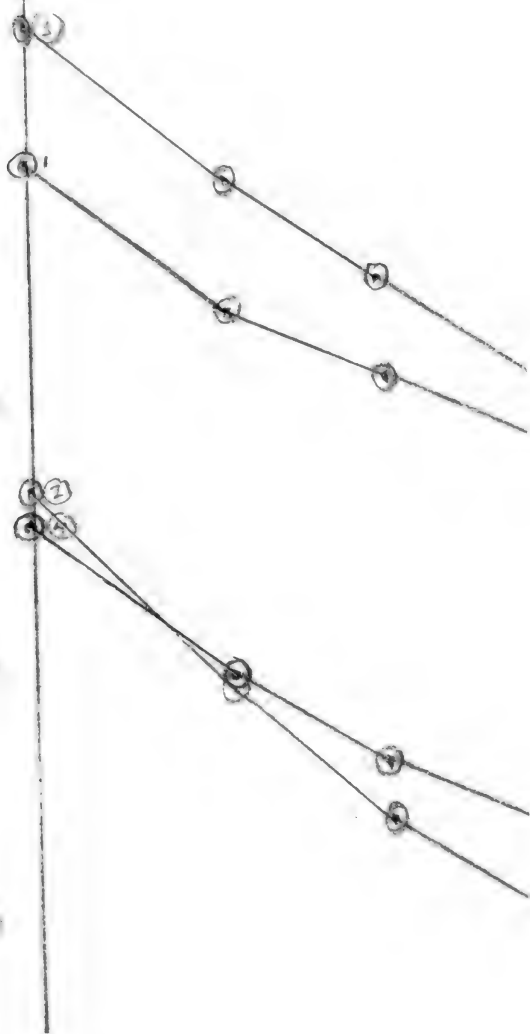
5.64419	5.89129	5.64414	5.86008
5.64419	5.89129	5.64410	5.86008
5.64423	5.89126	5.64413	5.86014
5.64420	5.89125	5.64412	5.86014
5.64420	5.89128	5.64411	5.86016
(28.22101)	(29.45637)	(28.22060)	(29.30060)

fare

5.64440
5.64432
5.64434
5.64432
5.64437
(28.22175)

46

EIGHT IN GM.

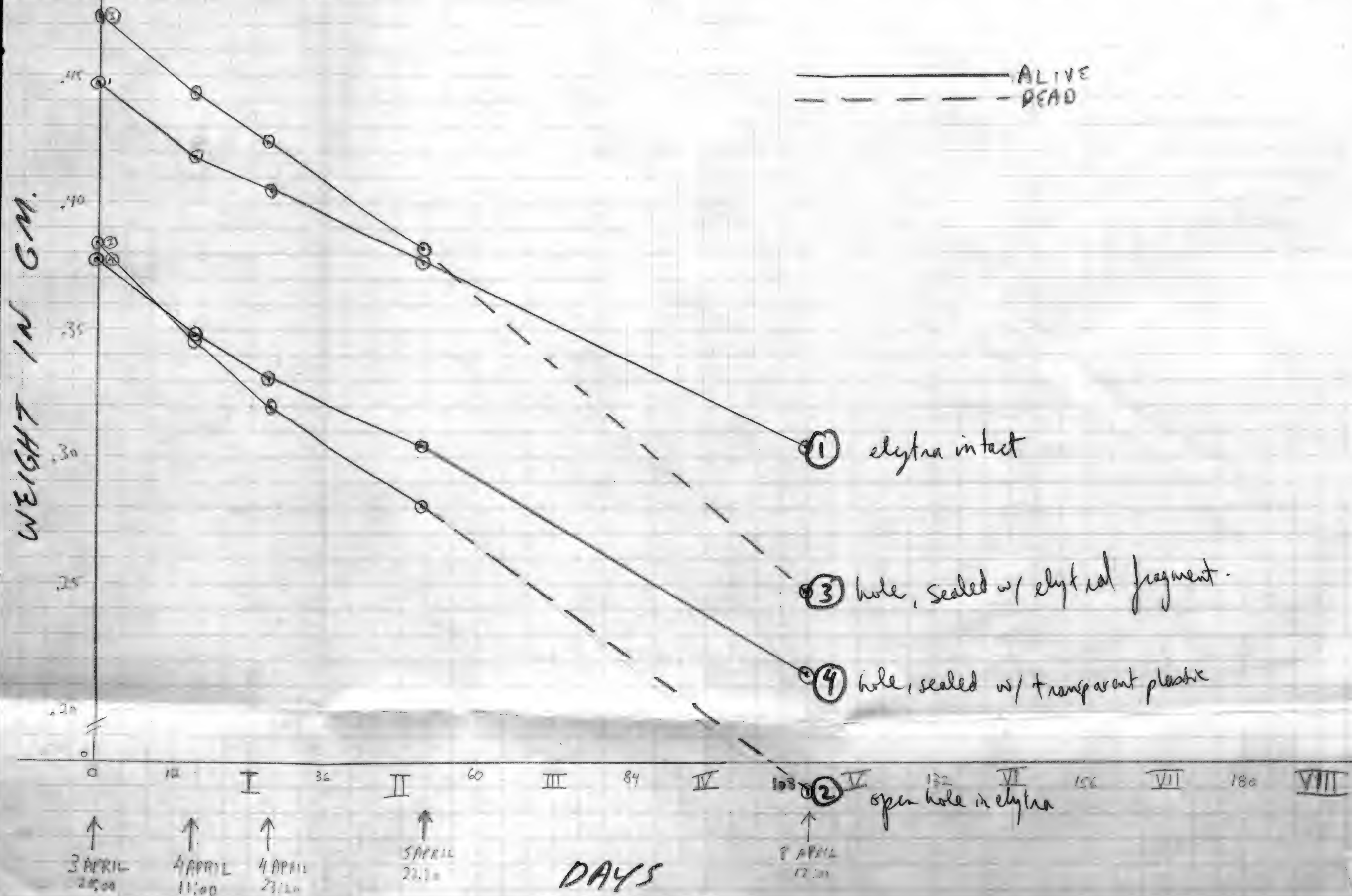


46

		1	2	3	4
3 Apr. 20.00	weight (meas)	6.08832 8	6.02661 4	6.11697 4	6.02173 6
	- tare (after)	5.64164 4	5.64279 4	5.64305 6	5.64290 8
	weight (beetle)	0.44668 4	0.38412 0	0.47391 8	0.37882 8
4 April	weight (meas)	6.06237 2	5.98940 0	6.08698 8	5.99231 8
11.00	- tare (after)	5.64247 6	5.64261 4	5.64314 2	5.64309 2
	weight (beetle)	0.41989 6	0.34678 6	0.44384 6	0.34922 6
	Δ weight	0.02678 8	0.03733 4	0.03007 2	0.02960 2
4 April	weight (meas)	6.04783 2	5.96272 4	6.06533 2	5.97249 0
23.20	- tare (after)	5.64163 0	5.64182 0	5.64195 8	5.64196 0
	weight (beetle)	0.40620 2	0.32090 4	0.42337 4	0.33053 0
	Δ weight	0.01369 4	0.02588 2	0.02047 2	0.01869 6
5 April	weight (meas)	6.01890 4	5.92277 2	6.02390 4	5.94863 2
23.30	- tare (after)	5.64108 2	5.64195 2	5.64220 4	5.64277 4
	weight (beetle)	0.37782 2	0.28082 0	0.38170 0	0.30585 8
	Δ weight	0.02838 0	0.04008 4	0.04167 4	0.02467 2
8 April	weight (meas)	5.94901 4	5.81349 8	5.89127 4	5.86012 0
12.00	- tare (after)	5.64427 8	5.64420 2	5.64412 0	5.64435 0
	weight (beetle)	0.30482 6	0.16929 6	0.24715 4	0.21577 0
	Δ weight	0.07299 6	0.01152 4	0.13454 6	0.09008 8
9 April	weight (meas)	.	.	.	.
23.40	- tare (after)	.	.	.	.
	weight (beetle)	.	.	.	.
	Δ weight	.	.	.	.

46

ABSOLUTE WEIGHT LOSS



3 Apr. 2

4 April

11:00

4 April

23.2

5 April

23.3

8 April

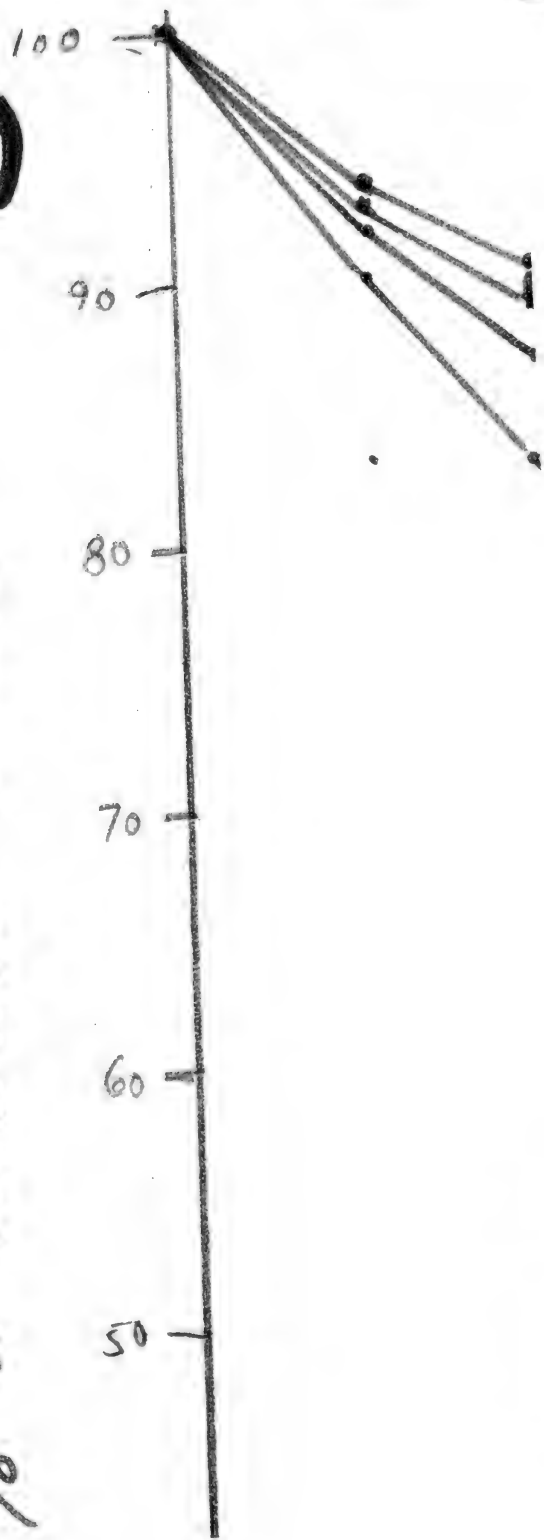
12:00

9 April

23.4

(46)

% OF ORIGINAL WEIGHT



plastic
segment

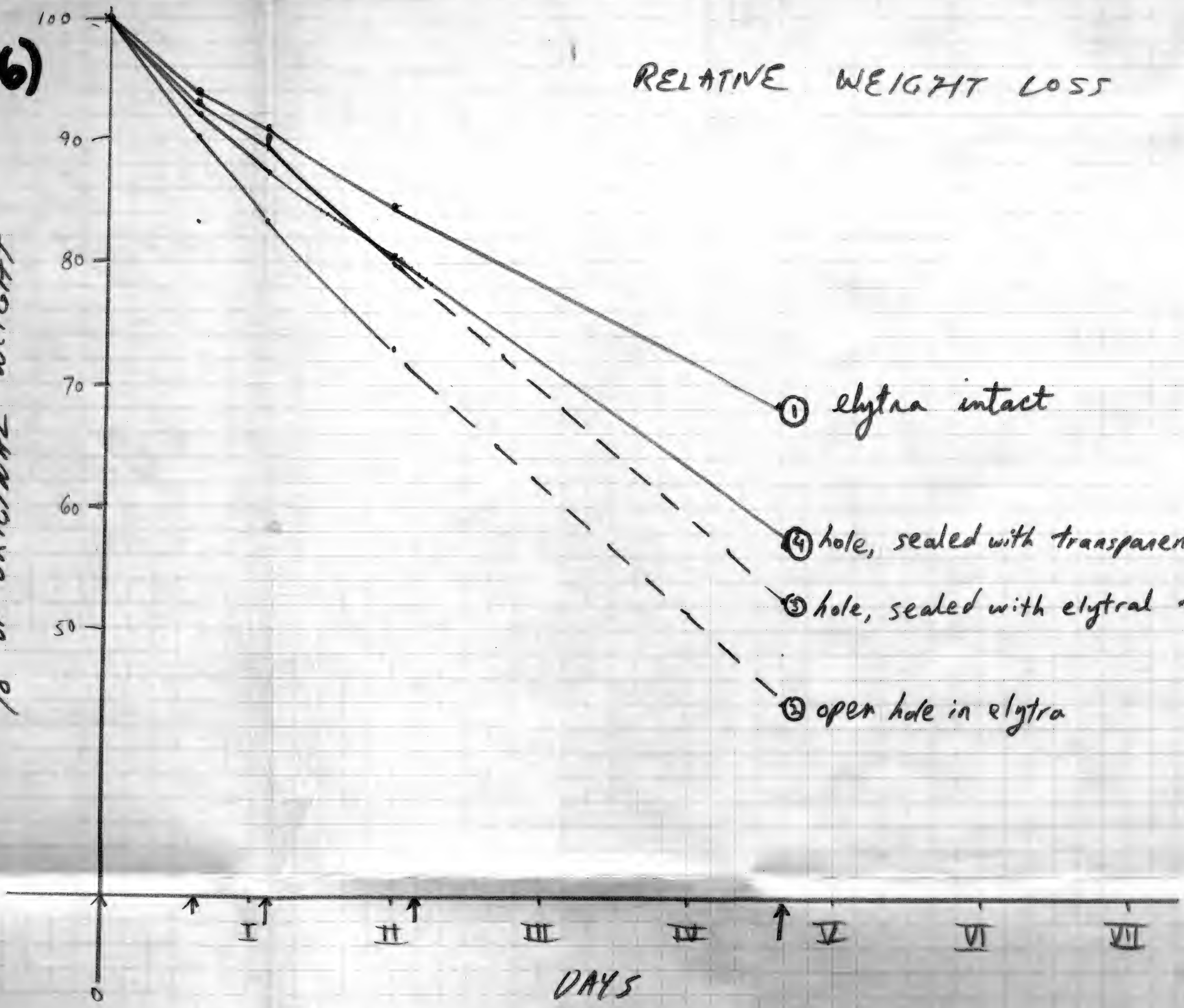
Relative weight Loss **46**

Date	1	2	3	4
3 Apr 20 ⁰⁰	100	100	100	100
4 Apr 11 ⁰⁰	94.0	90.2	93.6	92.1
4 Apr 23 ⁰⁰	90.9	83.5	89.3	87.2
5 Apr 23 ⁰⁰	84.5	73.1	80.5	80.7
8 Apr 12 ⁰⁰	68.2	(44.0)	(52.1)	56.9
9 Apr 23 ⁴²				

(46)

RELATIVE WEIGHT LOSS

% OF ORIGINAL WEIGHT



DAYS

9 April
23.40

tare

1

46

tare

(DEAD)

2

5.64375

5.88876

5.64425

5.72989

5.64377

5.88877

5.64423

5.72989

5.64382

5.88877

5.64426

5.72990

5.64388

5.88872

5.64429

5.72995

5.64392

5.88880

5.64430

5.72999

() () () ()

(DEAD)

tare

3

tare

(DEAD)

4

5.64426

5.78812

5.64438

5.80132

5.64426

5.78812

5.64434

5.80138

5.64429

5.78810

5.64434

5.80139

5.64426

5.78812

5.64434

5.80142

5.64431

5.78812

5.64436

5.80146

() () () ()

tare

5.64318

5.64312

5.64309

5.64312

5.64311

()

44

46

11 April

2:55

fare

1

fare

2

5.64119

5.81630

5.64224

5.71757

5.64130

5.81623

5.64231

5.71751

5.64137

5.81624

5.64228

5.71759

5.64138

5.81635

5.64234

5.71762

5.64142

5.81639

5.64238

5.71764

()

()

()

()

fare

3

fare

4

5.64107

5.76006

5.64120

5.74235

5.64113

5.76003

5.64128

5.74230

5.64116

5.76005

5.64128

5.74227

5.64121

5.76005

5.64132

5.74226

5.64126

5.76011

5.64134

5.74228

()

()

()

()

fare

5.64149

5.64148

5.64151

5.64154

5.64154

()

40

(47)

35

30

25

 $t_c^{0.20}$

521

021

52

18 April 1968 16:00

48

71

Experiments with 2 *Staphylinids* coll.
v.e. Langmuir Lab 10 April 1968 R.S.
being fed *Tribolium castaneum* & *confusum*,
Synthetic wild types and MSG mutants - LARVAE

T. confusum SYN. W.L.O.: offered, ate in 9 min,
macerated in $\frac{1}{2}$, then ate head end. at
tail it behaved like man with bone in throat,
pushing at head with prothoracic legs, dropping
food from mouthparts, wiping palps &
mandibles in sand and w/ legs.

T. confusum, MSG mutant.

40

(47)

35

30

25

20

15

10

0

25

50

75

100

125

150

175

200

225

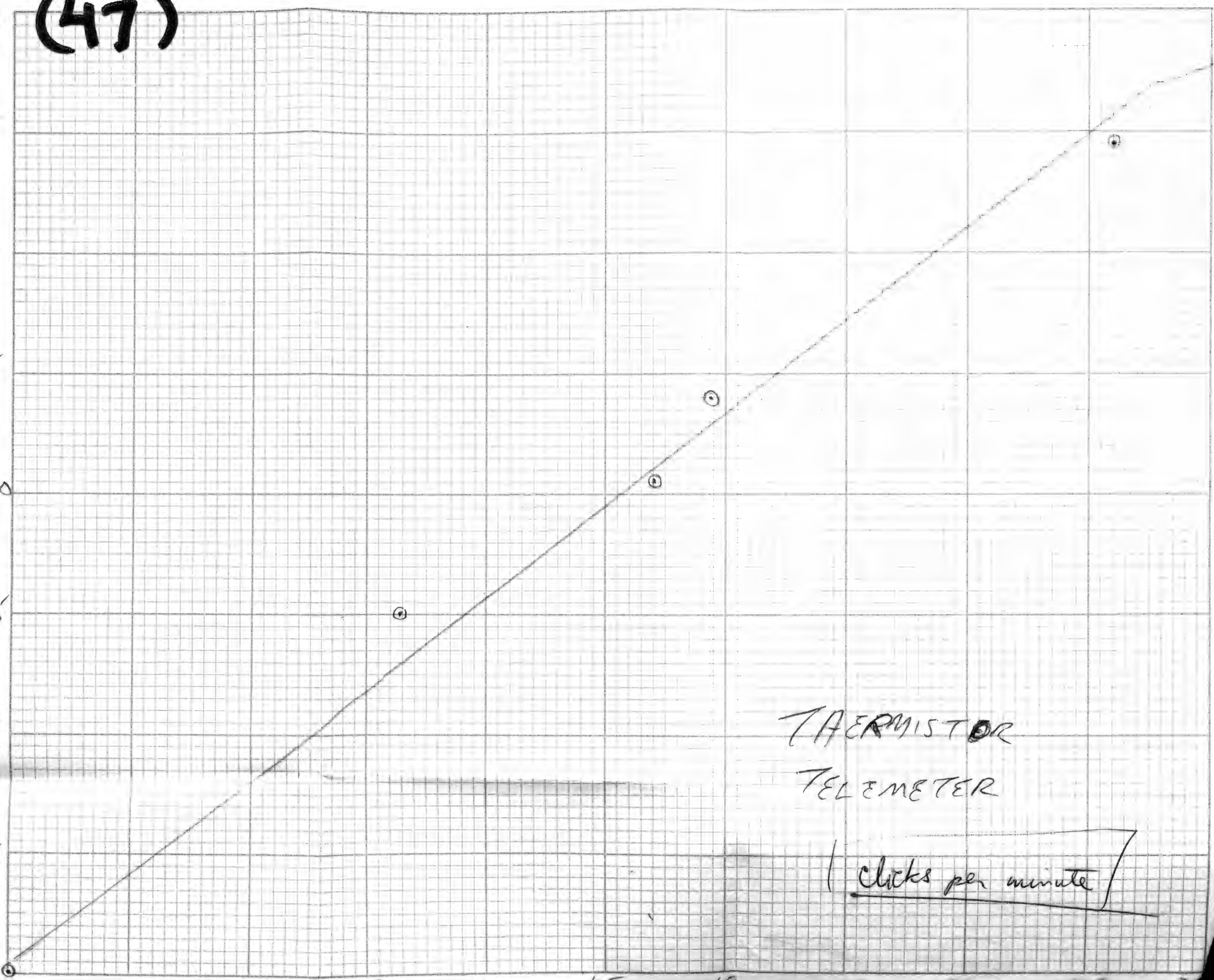
250

TC

"THE EFFICIENCY LINE" NO. 810
CROSS SECTION 10 SQUARES TO INCH

THERMISTOR
TELEMETER

clicks per minute



84

40

35

30

20

10

MINIATURE
PERSONAL ACCOUNT BOOKS
for home and office



NO. 2044 OPEN STOCK

in following rulings

JOURNAL • CASH • S. E. LEDGER

RECORD • D. E. LEDGER



NO. 2044-A ASSORTMENT

consisting of

3-JOURNAL 3-CASH 2-S. E. LEDGER

2-RECORD 2-D. E. LEDGER



Made in U.S.A.

DICKMAN'S WAYFARER INN

ROLLA, MISSOURI

ROOM	RATE	DATE	AMT. PAID	RECEIVED BY
33	8.00	9-13-67	8.15	Ray

THIS IS YOUR RECEIPT

THANK YOU

Oct 3 1967

Received from Bob & Margaret

Sept and 12 U. S. 20 MOTEL
1,000 7 MILES EAST OF GAR ¹⁹⁶Rolla

PORTAGE, IND. Phone 762-7185

\$ 6.12 Richard McDonald

Made in U. S. A.

DICKMAN'S WAYFARER INN

ROLLA, MISSOURI

ROOM	RATE	DATE	AMT. PAID	RECEIVED BY
33	5.00	9-13-67	5.15	Ray

THIS IS YOUR RECEIPT

THANK YOU

Oct 5 1967

Received from Bob Silberglied

Sur and 12 U. S. 20 MOTEL
1.00 7 MILES EAST OF GAY¹⁹⁰ Dollars

PORTAGE, IND. Phone 762-7185

\$ 6.12 Richard McDonald

Made in U. S. A.

Go (1) Crown Motel, R. D. #1, Milan Ohio 9/12/67 \$5.20
 Go (2) Dickman's Wayfarer Inn, Rolla, Mo. 9/13/67 5.15
 Go (3) Casey's Corona Motel, Box 395, Corona, N.M. 10/3/67 4.25
 Go (4) Guest House Motel Inc, [?] 8.24 [?] 9/14/67 2.74
 Go (5) Ace Motel, [?] 11.50 [?] 9/15/67 3.66
 Come (1) Brookshire Motel, Tulsa, OKLA 10/4/67 3.00
 Come (2) US 20 motel, [?] Portage, Ind. 10/5/67 3.00

16.10		27.00
6.49		
7.46		
24.00	100.00	720
<u>54.05</u>	96.55	890
274	345	649
375		746
649	205	200
	175	800
	366	700
	746	700
17		
51	250	
	17	
	<u>1750</u>	
		5405
		425

3.75
 14.00
 48.00
 4.50
 7.46
 6.49
 8.90
 7.24
100.30

9/10	5.20
9/15	3.5
9/16	—
9/17-10/2	—
10/3	4.25
10/4	—
10/5	—
10/6	—
10/7	—
10/8	—
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12/15	—
12/16	—
12/17	—
12/18	—
12/19	—
12/20	—
12/21	—
12/22	—
12/23	—
12/24	—
12/25	—
12/26	—
12/27	—
12/28	—
12/29	—
12/30	—
12/31	—

STATE OF NEW YORK - TRAVEL VOUCHER

EDUCATION DEPARTMENT

CORNELL UNIVERSITY—STATE COLLEGES AND EXPERIMENT STATIONS

Voucher No.

State Agency:

Dept./Div. Code

Pay to:

Payee Name ROBERT ELLIOT SILBERGLIED

Social Security No.

Transportation Requests Used: Yes ☐ No ☐

[illegible]

Travel Order
No. (s) _____

Official Station

Total Amount of this Voucher

CERTIFICATION AND AGENCY APPROVAL

I hereby certify that the above account and schedules annexed are just, true and correct; that no part thereof has been paid, except as stated therein, and that the balance therein stated is actually due and owing.

Dated _____ 1967

Home Address 37-B Hasbrouck Apts

City Ithaca, New York

Signature _____

Graduate Student
Official Title

FOR FINANCE AND BUSINESS OFFICE USE ONLY

Approved for
Payment _____

Signature _____

Title

EXPENDITURE CODES

[illegible]

CORNELL UNIVERSITY—STATE COLLEGES AND EXPERIMENT STATIONS

Dept./Div. Code

Yes ☐ No ☐

Travel Order
No. (s) _____

Official Station

Total Amount of this Voucher

MAJOR	X			FUNCTION	X	
MINOR	X			OBJECT	X	
DEPT.	X			SUB.		
ACCOUNT				PROJECT		

TRAVEL NOTICE NUMBER _____

Signature of Superior

ENCUMBRANCE LIQUIDATION \$_____

Title

EXPENDITURE CODES

[illegible]

DUPLICATE

STATE OF NEW YORK - TRAVEL VOUCHER

EDUCATION DEPARTMENT
CORNELL UNIVERSITY—STATE COLLEGES AND EXPERIMENT STATIONS

Voucher No. _____

State Agency: _____

Dept./Div. Code _____

Pay to:

Social Security No. _____

Transportation
Requests Used:

Yes ☐ No ☐

Payee Name

ROBERT ELLIOT SILBERGLIED

Date 19 67	ITEMS OF EXPENDITURE Specify Purpose of Travel	TIME		Transpor- tation Paid	SUBSISTENCE				Miscel- laneous	Sub. Vo. No.	TOTAL
		De- parture	Arrival		Break- fast	Lunch	Dinner	Room or Rm. & Bd.			
9/12	Bring totals from final T E V-3, sheet No.						2.00				
9/13					1.00	1.75	1.00	5.15			
9/14					1.00	1.00	1.75				
9/15					.75	1.00	2.00				
9/16					1.00	1.00	-				
9/17 - 10/2											
10/3					.50	1.25	2.00				
10/4					.75	1.00	2.25				
10/5					1.00	1.00	2.00				
10/6					.75	1.00	2.50				
TOTAL											

Travel Order No. (s) _____	Official Station _____	Total Amount of this Voucher _____
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EMPLOYEE COPY

Employee—Retain this copy for your files.

